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Editorial Comment

It Hasn't Worked Many millions of charity dollars have been collected and spent in attempting to educate the public concerning the facts of tuberculosis during the last thirty-five years. According to a recent Gallup Survey only 19 per cent of the public know that tuberculosis is caused by a germ. Judging by this survey, it would take 150 years to educate the public to the simple fact that tuberculosis is caused by a germ. It is probably safe to assume that this same 19 per cent is being reached year after year by the publicity campaigns directed to the public. Evidently, the other 81 per cent of the population has not yet been reached and there is no assurance that they will ever be reached through our present program of education. Should future millions, contributed to eradicate tuberculosis, be similarly squandered on salaries for so-called teachers of the public? Our answer is emphatically, NO!

This is not being written as an unkind criticism of the past actions of any individual or group. We just did the best we knew. But, now we know better.

Educating farmers never eliminated tuberculosis from bovine herds. The veterinarian had to go into the herd, find the tuberculous animals and then separate the infected from the healthy. Then, and only then, did we see significant elimination of bovine tuberculous infection.

In view of our present knowledge concerning case finding in tuberculosis, we suggest that a large portion of the money now being spent on education be directed toward case finding, toward the type of case finding that is most neglected. By this, we mean the x-raying by rapid method of the manual worker. A survey of manual workers will yield six times as many infected and infectious cases needing treatment as will a survey of college or other "white collar" groups. And since groups can be surveyed at a rate of seventy-five cents a person, organizations which spend three dollars and fifty cents a person for surveys will find explanations difficult to make when they are called to account. And one thing is certain, an accounting day always comes sooner or later. Quoting Dr. Esmond Long, "Look for tuberculosis where it is to be found."

Monies spent in this direction would be certain to produce beneficial results. Not only will we be finding open cases of tuberculosis, but at the same time, we will be enlisting the aid of many physicians who show no interest in tuberculosis under the present program.

We know that changing the direction of the flow of funds, donated to eliminate tuberculosis, from education to case finding will require sacrifice—sacrifice of salaries and jobs that are time honored. But, isn't it better to sacrifice jobs than to let human beings go on dying of tuberculosis and spreading it, unknowingly, until shortly before they die?

With all of our education and despite all of the millions spent in this direction during the past thirty-five years, still 80 per cent of the tuberculous have advanced disease when they are discovered. This percentage matches well with the insignificant 19 per cent of our population who know that tuberculosis is caused by a germ.

Now that we know the facts, how much longer are we going to continue the squandering of public funds? The officials of organizations who are accepting such funds from a trusting public must take cognizance of these facts.

Let us PAY for case finding WORK and not for talk and let us do it NOW.

F. W. B.

The Dawn There are a few bright spots on the horizon which foretell the coming of another and better day in the War of Tuberculosis Eradication.

Last year the Brooklyn Tuberculosis and Health Association (N.Y.), a component of the National Tuberculosis Association, out of gross income of $62,000.00 from the sale of Christmas Seals, spent $16,043.00 on case finding through utilization of the inexpensive rapid film method of x-ray.

Last year the Queensboro Tuberculosis and Health Association (N.Y.), another of the National Tuberculosis Association components, with a gross from Christmas Seals of $58,000.00, similarly expended $15,777.00.

These organizations are finding cases, the cases are being segregated and many of them cured. These organizations can teach many of us something, many of us who like so well to talk about teaching others what they need to know about tuberculosis eradication. How much easier and more comfortable it is to teach than to learn!

One of the present activities of the Brooklyn Association is the encouragement of the public to get a chest x-ray done for ONE DOLLAR. They widely advertise through press and handbills that on the First and Third Mondays of every month between 2 and 6, and 7 and 9 p.m., x-rays of the public will be taken at certain convenient locations throughout Brooklyn. They also stress the fact that Christmas Seals help pay the cost. Doctors must remember that these facilities do not compete with the local x-ray specialist, that every case found by survey methods is referred to the Family Doctor, or, if indigent, to the clinic physician. Every survey means help in the eradication of Tuberculosis through finding tuberculosis cases earlier, and brings worthwhile work to the doctor and x-ray specialist at a stage when the reputation of the Medical Profession can be enhanced by the effect of treatment.

F. W. B.

"Nose Drops" The danger of intra-nasal medication and the particular difficulty in removal of aspirated liquid petroleum suggests that this oil should not be used in the respiratory tract, and that when given orally, care should be exercised to prevent the aspiration of it.

Lipoid pneumonia is not uncommon as a result of the aspiration of various oils. Patients of any age with some central nervous involvement are quite prone to aspirate oil when introduced intra-nasally. This is also true in small infants with debilitating diseases, or those in which repeated vomiting occurs. Other patients, usually adults, who use oils over long periods of times as nasal douches and laryngeal sprays are constantly exposing themselves to lipoid pneumonia.

A large factor which enters into the development of lipoid pneumonia is the type of oil inspired. These may be grouped into three classes—vegetable oils, animal oils and mineral oils. The slight anesthetic action of menthol and similar compounds probably aids in the passage of some of this oil into the larynx and trachea.

Promiscuous use of nose drops with an oil base should be discouraged, especially in infants, because of the great tendency to lipoid pneumonia, which not infrequently proves fatal.

C. M. H.

The Role of the General Practitioner in Pulmonary Tuberculosis

Epidemiology and Pathogenesis*

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Epidemiological Data

The problem of tuberculosis is complex, because it is a frequent disease, because it is a contagious disease, because it is an exquisitely chronic disease and because its social and economic implications are frequently of such a nature that they overshadow in complexity and importance the purely medical aspects. Since it is frequent, so frequent still, that it is the most important cause of death in early adult life, it deserves the fullest attention of all agencies concerned, first amongst whom stands, as I hope to show, the private physician. Since it is contagious, every physician attempting to help in its treatment or prevention, must consider himself a public officer and must visualize his duties to be beyond the care of the individual patient in the preventive field. Since it is a chronic disease, born in poverty and producing in its turn poverty, the physician must become a social worker and must be wide awake to the socio-economic background of his patients.

In order to attack a problem intelligently one must know its nature and its magnitude. Through the courtesy of Mr. Drolet, the statistician of the New York Tuberculosis and Health Association, I can present a few figures concerning tuberculosis in our own borough, the Bronx. Our most reliable statistics concerning tuberculosis are still mortality statistics. In the first table are presented the number of annual deaths and the death rates during the decade 1929, to 1938, showing an encouraging decline in the death rate and the relatively good standing that the Bronx makes in comparison with New York City as a whole. The second table shows the actual number of known cases for each year during the last decade. The question then arises as to whether or not we know all the living cases. By comparing, in Table III, the known cases each year with the corresponding deaths,

TABLE I.

Tuberculosis Mortality, Borough of Bronx and City of New York

1929—1938

Year	Deaths	Bronx Rate*	New York Rate*
1929	695	57	75
1930	702	55	73
1931	645	49	70
1932	578	43	64
1933	652	48	64
1934	599	43	61
1935	557	39	60
1936	642	45	62
1937	569	39	57
1938	522	35	51

*Based upon reports, Department of Health, City of New York. * Per 100,000 population.*

TABLE II

Bronx—Tuberculosis Registration Ten Year Period, 1929-1938

Year	New Cases* Number	Reported Case Rate[1]	Remaining in Register End of Year[2]
1929	1,924	157	4,368
1930	1,672	131	3,159
1931	1,651	126	3,218
1932	1,525	114	2,715
1933	1,396	103	2,716
1934	1,409	102	2,662
1935	1,303	92	2,873
1936	1,216	84	2,800
1937	1,252	85	3,201
1938	1,136	76	3,111

*Based upon reports, Department of Health, City of New York. * All forms of tuberculosis 1—Per 100,000 population. 2—Pulmonary cases only on December 31.*

* Read before the Bronx County Medical Society as part of a Symposium on the Role of the General Practitioner in Pulmonary Tuberculosis, November 15, 1939.

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it can be seen that for every death, from 4 to 6 living cases of tuberculosis are known in the registry. Although there are good reasons to assume that the actual ratio of living cases to deaths is higher, probably about 9 to 12, the ratio existing in the Bronx compares favorably with many other communities and is indicative of active and efficient case-finding work and a high degree of the reliability of reporting. We should next have to know in what condition the newly diagnosed cases are found. For this, only the new cases diagnosed in the Tuberculosis Clinics of the Department of Health are available, as shown in Table IV. The fact that nearly 50 per cent of these cases were minimal in 1938 is most gratifying, but it must be kept in mind that the table contains only the cases diagnosed in the Clinics and these represent less than one-half of the total new cases for 1938 which amounted to 1136. Judging from hospital admissions in the whole metropolitan area, or in the United States, there is still a woefully small percentage of minimal lesions.

TABLE III.

Ratio of Known Cases to Death
For Period 1929-1939
(Bronx)

Year	Cases in Registry, End of Year	Deaths	Ratio Cases to Death
1929	4368	695	6.5
1930	3159	702	4.5
1931	3218	645	5.0
1932	2715	578	4.7
1933	2716	652	4.2
1934	2662	599	4.4
1935	2873	557	5.1
1936	2800	642	4.4
1937	3201	569	5.6
1938	3111	522	6.0

With the knowledge that we have approximately 3100 diagnosed cases in the Bronx, meaning one case in about every 500 persons alive, it becomes important to know how these cases are distributed throughout the community. If they are evenly scattered, we must either rely on chance examination to discover these cases, or we must examine the entire population to find them. However, all available data on tuberculosis indicate that certain groups of the population are much more afflicted by this disease than others; hence the case-finding activities must be selective to yield the best results. There is first the uneven distribution according to ages. This is shown in Table V, for the whole United States rather than for the Bronx, because the smaller area is more likely to yield chance distortions. It is shown in terms of death rates instead of morbidity rates, not by choice but by necessity, since we have no complete and reliable morbidity statistics.

TABLE IV.

New Cases Diagnosed in Tuberculosis Clinics During 1938

Borough of the Bronx and New York City

	Bronx	
	Number	Percent
Pulmonary		
Minimal	204	48.0%
Mod. Advanced	146	34.4%
Far Advanced	75	17.6%
Total Active	425	100.0%
Arrested	10	
Non Pulmonary	0	
Childhood Type	56	
Total	491	

Based on reports by courtesy of associated clinics to the Tuberculosis Clinic Committee, New York Tuberculosis and Health Association.

TABLE V.

Deaths and Death Rates From Tuberculosis
United States — 1937

Age Groups	Number of Deaths from Tuberculosis, All Forms	Death Rate per 100,000 Population
All ages	69,324	53.6
Under 5	1,931	18.0
5-9	599	5.0
10-14	1,054	8.3
15-19	3,982	33.1
20-24	7,088	61.6
25-29	7,550	70.4
30-34	6,931	71.5
35-39	6,557	73.5

40-44	6,492	71.8
45-49	6,119	78.9
50-54	5,409	80.5
55-59	4,499	80.9
60-64	3,685	89.1
65-69	3,225	99.8
70-74	2,031	92.4
75-79	1,349	104.4
80 and over	771	85.2

From the fact that the death rate in early childhood is relatively low the erroneous conclusion has been drawn that tuberculosis in this group pursues a mild and benign course. The death rate is an indication of the relative rarity of the disease in early childhood rather than of its benignity. The fatality rate of infected children up to five years of age in New York City in the period of 1930 to 1932 was, according to Drolet, 430, as compared with approximately 140 for the age group of 20 to 50. We have seen that in the Bronx we had at the end of 1938 six times as many cases as deaths during the year. If we use this factor of six, we will find, for example, that between the ages of 5 and 14 we would have to examine more than 2500 children to find one case of clinical disease; that, on the other hand, in the age group above 25 we would have to examine only about 200 persons to find one clinical case.

There exists a parallelism between tuberculosis mortality and socio-economic conditions which should direct case-finding efforts into definite channels; it indicates at the same time a most powerful factor in the pathogenesis of the disease. The dependence of tuberculosis mortality on economic conditions may be further emphasized by the survey work of the Department of Health of New York City. Dr. Edwards has found in surveys comprising about 200,000 persons that approximately 2.5 per cent of the individuals that were x-rayed showed clinically significant lesions of pulmonary tuberculosis; in high school students and in students working under the National Youth Administration, 0.3 and 1.0 per cent, respectively, were found. On the other hand, when close to 5000 homeless transient males with an average age of about 50 years, economically poor and maladjusted, as a whole were surveyed, 5.3 per cent were found to have clinically significant lesions.

To point out further the concentration of tuberculosis in certain population groups, it must be remembered that the tuberculosis mortality for the Negro is about 3 times as high as that for the white in the whole United States. However, in New York City, the adolescent Negro has a death rate 15 to 40 times higher than the white in the same age group. The Irish are considerably more susceptible than the Jews, young women throughout their child-bearing period contract the disease more frequently than men of the same age, persons living in close contact with contagious cases have a higher morbidity than non-contact cases, certain constitutional types are more endangered than others and, finally, certain diseases, diabetes for example, increase the susceptibility to tuberculosis.

Such figures are, of course, of fundamental importance in case-finding activities where, with limited funds, the optimal results must be obtained. For the private practitioner in individual practice, the problem is somewhat different. He does not select from a large population certain groups promising to yield the greatest percentage of cases. He must find the case whether the chance is one in 3000 or one in 10. He should, therefore, whenever opportunity presents itself, think of tuberculosis and exclude it with adequate diagnostic technique. However, this chapter belongs in the next paper.

Having diagnosed and registered the cases here in the Bronx, what happens to them? The next table provides the answer for the 3131 cases on the registry in the Bronx at the end of September, 1939. It is only necessary to point out that the private physician takes care of a greater percentage of tuberculosis cases than any other agency to justify the fact that this Medical Society is devoting one evening to the discussion of tuberculosis. Unfortunately, there are no definite data available to show the practitioners' participation in the diagnostic activities. However, in Detroit, where tuberculosis case-finding is a matter of closely knit cooperation between practitioners and Health Department, about 30 per cent of adult-type active tuberculosis was diagnosed in the minimal stage.

TABLE VI.

Type of Care of 3131 Known Cases in Bronx Sept. 30, 1939

	Cases	Per Cent
Private Physician	1047	34
Hospitals and Sanatoria		
In City	636	20
Out of Town	386	12
Clinic Care	739	24
At Home	197	6

It is probably a surprise to see that only 20 per cent of Bronx patients are in institutions in the city and that only a total of 32 per cent are hospitalized at all. The next table explains why. The discrepancy between bed capacity and known cases of tuberculosis is obvious. What is true of New York City is true of the country as a whole. There is good evidence to assume that there are more than half a million cases of tuberculosis in the United States of America; there was a total bed capacity of 89,692 in 1938. In the different states, the ratio of beds to annual deaths varies from a low of 0.2 in Alabama to a high of 4.0 in Colorado, with New York State, whose ratio is 2.1, standing above the average for the whole country which is 1.4.

TABLE VII.

Total Bed Capacity and Actual Occupancy New York City and Known Cases June 30, 1939.

	Bed Capacity	Occupancy	Cases in Register Dec. 31, 1938
All 25 Institutions	5,457	5,812 (106.5%)	19,758

Obviously, not all patients with tuberculosis can be hospitalized, nor do they all need hospital care. With the limited facilities available, it becomes fundamentally important—and here lies with his diagnostic duties, the greatest responsibility of the private physician—to utilize the available beds in the best possible manner. There are, mainly, two medical reasons for hospitalizing a tuberculous patient: (1) the need of active treatment; and (2) the need of isolation since he is a source of contagion. The indications for hospital treatment will be discussed by Dr. Mayer.

Can we isolate in hospitals and sanatoria all sputum-positive cases? Obviously not. Which cases, then, should be selected for isolation? The most dangerous ones. Does this mean chiefly the patient with far advanced, cavernous, hopeless tuberculosis? Not necessarily, for he has in the preceding years of his illness probably done all the harm that he is likely to do in his particular environment. In other words, the criteria for isolating the hopeless case must be derived from his past and his human and social surroundings, as well as from the condition of his lung. Since young children are more susceptible than adults, they should be protected. This is not infrequently done more efficiently by removing the children instead of the dying patient. It is impossible to put down hard and fast rules regarding isolation: each case must be studied with full awareness of the socio-economic implications. The open case in a well-to-do household, in which there is an understanding of the hygienic necessities, is probably no menace.

How are the hospital beds actually used? Do they produce the maximum good for the maximum number of people—patients and their relatives? I think not. The tuberculosis wards are crowded with patients who are neither in need of nor able to profit from the specific care that the hospital is prepared to give and that neither clinic nor private physician can provide; they are crowded with patients, who—had they half-way adequate home surroundings—could and should be cared for by their private physicians.

Instead, modern hospital facilities should be used for the patient presenting a difficult diagnostic problem, for the patient in whom collapse therapy procedures should be used or, at least, initiated. Patients should be sent to the hospital when thoracoplasty is a hopeful and rational procedure and not when it is the last refuge from practically certain failure. The avoidable and unavoidable complications, spontaneous pneumothorax, empyema, extrapulmonary tuberculosis, complicating nontuberculous disease, should all probably call for more frequent, and certainly for earlier hospital admission than is so often the case. There are three great agencies for

the treatment of the tuberculous: the private physician, the clinic, the hospital. They will be utilized to the best advantage only when the patients are distributed with a more purposeful understanding of the specific function that each has to perform.

Pathogenesis

A brief outline of the typical pattern of development of tuberculosis should be helpful not only for a profounder understanding of the disease, but for correct therapeutic indications and prognosis and for the decision of where a given patient should be cared for. I shall follow here essentially the statements in Diagnostic Standards of the National Tuberculosis Association, because they represent what may be called a majority opinion of experts. Our knowledge in many essential details is too incomplete and uncertain to speak in an apodictic and final way.

In our country, where bovine tuberculosis is practically eradicated and the bacteriological control of milk has reached a standard of high excellence and where, therefore, intestinal infection is extremely rare, the first infection with the tubercle bacillus occurs in the overwhelming majority of cases in the lungs.

The focus produced in the pulmonary parenchyma by the first invading bacilli consists of a small tuberculosis pneumonia, which undergoes rapid caseation. During this process, the regional lymph nodes in the hilum become infected by lymphatic drainage and there, too, the foci undergo caseation. The most frequent development of the primary complex, consisting of parenchymal and lymph node foci, is encapsulation and calcification. This entire process usually occurs without apparent signs and symptoms, but a few weeks following the primary infection, the tuberculin test becomes positive. Whether or not the calcified remnants of the primary complex are roentgenologically demonstrable depends on fortuitous circumstances of localization and size. In a small, but not exactly determined percentage of cases, particularly in young children intimately exposed to prolonged infection, the primary complex shows progession instead of healing. The parenchymal pneumonic focus then becomes a lesion of considerable size and the hilar lymph nodes become large enough to be easily demonstrable roentgenologically. In other cases, the parenchymal focus heals and the lymph node process alone progresses. If progression occurs, tubercle bacilli may spread by all available channels: lymph stream, blood stream, bronchi. In the latter event, at times initiated by rupture of massive caseous lymph nodes into a bronchus, caseous and cavernous pulmonary tuberculosis with hopeless prognosis may follow. Blood stream infections, depending on their massiveness, may remain clinically silent, or—in the other extreme—may lead to generalized miliary tuberculosis.

Numerically more important are the cases in which a small number of bacilli reach the blood stream from the primary lymph node foci, causing single or multiple lesions in the lungs, bones, kidneys and other organs. Scattered hematogenous foci in the lungs, frequently in the upper thirds, may progress to frank open pulmonary tuberculosis, but more frequently they lead to fibrosis and calcifications to form apical scars, seen so often in later life. These apical foci may, after varying periods of latency, break down and discharge bacilli into the bronchial tree and thus initiate the characteristic pulmonary tuberculosis of adult life. Other mechanisms that may start this disease are: inhalation of bacilli from the outside (exogenous reinfection); reactivation of the primary parenchymal focus, with a following discharge of bacilli, at best an extremely rare occurrence; rupture of a caseated lymph node, belonging to the primary complex, into a bronchus, causing a tuberculous aspiration pneumonia; bacilli from such a lymph node may by lymph and blood stream reach the lung and set up single or multiple foci. It cannot be decided, in the present stage of our knowledge, which of these mechanisms occur most frequently, but, regardless of how the bacilli reach the lung, the result is usually one, and more rarely, several pneumonic foci. If single and seen at a really early stage, such a focus is small, less than 3 cm. in diameter; it is frequently localized in the subclavicular region or in the mid-lung field. This focus is the so-called early infiltrate. It is an unstable lesion which tends to progress or retrogress rapidly. Absorption and fibrosis may leave a small fibrotic scar; caseation and liquefaction, an isolated, rather thin-walled cavity.

Once a cavity is formed, intrabronchial spread by means of the bacilliferous exudate in the cavity is most likely to occur. New regions of the lungs become infected, new infiltrates are formed. Some may heal by fibrosis and absorption, some will progress and excavate. Bacilliferous sputum may carry the infection beyond the confines of the lungs to the larynx and to the intestines. The development of this chronic cavernous progressive pulmonary tuberculosis is punctuated by relatively acute periods of new invasions and excavations and by chronic processes of repair.

During the course of chronic pulmonary tuberculosis which, as was emphasized, is characterized by intrabronchial dissemination, hematogenous spread may occur. It may involve only the lungs and complicate both the picture and the prognosis of the original disease, it may produce extrapulmonary foci in bones, kidneys, genital organs, adrenals and meninges. It is, then, the mere accident of localization which will determine the issue. Mention should be made of pulmonary tuberculosis which is apparently due to hematogenous seeding only. Such cases show symmetrically disseminated more or less nodular lesions. These patients frequently exhibit an astounding discrepancy between the anatomical extent of their lesions and the extreme paucity of their symptoms.

Of course, pulmonary tuberculosis does not always show this relentless progression, interrupted by healing and quiescent phases. It may become arrested and heal at any phase. The early infiltrate may heal and its bearer may be left with unimpaired function. But once wide-spread lesions have formed, healing occurs only by fibrosis and its unavoidable sequence: emphysema, reducing considerably the respiratory reserve. When in extensive lesions extensive collapse therapy becomes necessary, healing of the tuberculosis can still be achieved in an imposing percentage of patients, but it is healing with marked functional defect and, at times, healing must be paid for with the crippling of the respiratory functions.

We should accentuate three main periods in the development of chronic pulmonary tuberculosis: (1) the early infiltrate (to find the case at this stage means early diagnosis; the patient may be asymptomatic, or have only slight, grippe-like symptoms; his prognosis is good, if promptly and thoroughly treated.); (2) the isolated cavity without major spread of the disease in the homolateral lung and no spread in the contralateral lung (this patient, too, may be practically asymptomatic, or he may have considerable symptoms of fever, fatigue and some cough; his prognosis is fair if proper treatment—often collapse therapy—is started immediately); (3) far advanced cavernous bilateral disease (this patient always has symptoms, which he may dissimulate, his prognosis is poor, regardless of the type of treatment he receives, although a certain percentage is saved by modern collapse therapy).

In conclusion, we may crystallize the role and the duties of the private physician in the great scheme of anti-tuberculosis work as follows:

He must diagnose the disease and he must do it in the early phases by looking for it in those who do not suspect it.

He must decide, according to the pathological status of the patient and his socio-economic situation, whether to treat the patient at home, send him to a specialist, to the clinic or to a hospital.

He must educate the patient and his family, examine all his contacts; he must be the health officer for the tuberculous family.

He must be prepared to receive and advise the patient again, following the hospital phase of his treatment.

Editor's Note—This paper will be followed in the April issue by Dr. Edgar Mayer's presentation of Diagnosis and Treatment, as they affect the general practitioner.

Famillial Spontaneous Pneumothorax and Other Spontaneous Pneumothorax

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A man is walking in the street. Suddenly he stops. He grips his side with both hands. He has a look of extreme distress. His mouth is open but he cannot get his breath. A deadly pallor spreads over his face.

Isn't this the typical history of a heart attack? Yes, it is. But it might equally well be a case of spontaneous pneumothorax.

The surgical type of spontaneous pneumothorax, i.e. the pneumothorax which happens quite frequently in the course of pneumothorax treatment, paracentesis and other surgical procedures on the chest, has met with careful attention in the medical and surgical text-books. The non-surgical type, however, is only superficially mentioned. Yet, its incidence is quite frequent, its symptoms are important from a diagnostic point of view, its treatment is well determined and may require urgent intervention.

The non-surgical spontaneous pneumothorax occurs most often in children and young adults. It may be caused by any abnormal condition of the lung, the pleura or the mediastinal organs — ("symptomatic type"). In the newborn, the majority of cases show some kind of congenital malformation of the lung. Among children the prevailing cause is pneumonia; among adults it is tuberculosis. In a large group of cases, however, no evidence of any underlying disease can be detected—("idiopathic type"). In the past some minimal pathology of the lung or pleura was supposed to exist in these patients and for lack of evidence a minimal tuberculous infiltration or scar was inferred. Recently, however, it has been proven on the basis of pathological studies, x-ray check-ups and critical evaluation of the clinical course that there is quite a large number of true idiopathic cases.

Various theories have been propounded regarding the pathogenesis of the non-surgical pneumothorax. In part of the cases there is undoubtedly a gross pathology of the pleura and of the underlying tissues, or there is a small cortical abcess, in which a true rupture of the diseased area occurs. But in a large number of patients such gross pathology is missing. In these latter cases an air vesicle on the lung surface ruptures after being distended by a valve-like mechanism. There are two kinds of valve vesicles, the one caused by local emphysema, the other one resulting from a surface scar secondary to a healed infection.[10] A contributing factor in the pathogenesis is a so-called "constitutionally weak pleura," which represents a "locus minoris resistentiae". Finally, a primary empyema may break through from the pleural space into the lung and, of course, any kind of chest trauma may cause a spontaneous pneumothorax.

In the event of complete pneumothorax the collapsed lung is retracted along the spinal margin. If adhesions prevent the lung from total collapse we find various types of selective pneumothorax. The left side is somewhat more frequently affected than the right. The perforation is most often located in the upper lobes. It may be hardly visible to the eye, or it may be as large as a dime. It may readily heal over and it may be covered with fibrin and not be detected at all.

Sometimes, the pneumothorax is preceeded by some kind of mechanical strain. Very often, however, the causative action, if existing at all, is a trivial one.

The occurrence of a spontaneous pneumothorax may not be noted at all and may be detected incidentally, or its symptoms may gradually develop over a long period of time, or it may strike suddenly with a severe attack. The most common symptom is pain which involves the entire side of the chest or which may be located substernally or in the shoulder or in the back. A very common feature is a marked heart consciousness, which is mostly associated with great anxiety and restlessness. Dyspnea of varying degree is common. It may be severe at the onset and gradually decrease, or it may develop slowly. If there is

* Rocky Glen Sanatorium.

an underlying lung disease the pre-existing dyspnea may grow much worse. Usually, there is marked pallor. Cyanosis as well as a sudden rise in temperature is quite frequent in children, but both are exceptions in adults. The pulse rate is always very high. Cough is frequent, but not constant and mostly of a dry, unproductive type. In extremely severe cases, syncope and general collapse supervene and a subnormal temperature may be found.

The physical findings in pneumothorax are many and variable. The affected side of the chest is increased in size, the interspaces are widened and bulging, the chest movements are limited, the apical heart beat is deviated or completely absent. Palpation reveals a typical elastic sensation over the interspaces —("air-cushion" sensation). The percussion produces the hyper-resonant, more rarely the tympanic, tone. Absence of respiratory mobility of the lower lung margin is noted and the limits of dullness of the neighboring organs are displaced. On auscultation the breath sounds are usually absent. Sometimes, however, tinkling rales or amphoric breathing may be heard. Pectoriloquy has a metallic note and the sign of the coin is positive. Vocal fremitus is diminished or absent. Effusions show the typical dullness in the lower part of the chest. The heart sounds are fast, but regular, unless there is an accompanying cardiac disorder. X-ray examination and aspiration of air after paracentesis prove the diagnosis.

The course of a spontaneous pneumothorax depends upon the type of the perforation. If it is pervious in both ways, as is the rule, and the patient does not immediately die in shock or collapse, the pneumothorax becomes stationary as soon as enough air has entered the pleural cavity to overcome the negative pressure. In part of the cases the opening is sealed over almost instantaneously—("closed pneumothorax") and the lung expands by absorption of the air within a few days or weeks. At other times the opening has less tendency to close ("open pneumothorax"). The collapse remains stationary for various periods of time and the re-expansion takes place very slowly. In exceptional cases the pneumothorax has persisted for life.

The displacement of neighboring organs is greatest in the closed type. especially when an effusion supervenes which increases the positive intrapleural pressure. But even in open pneumothorax, in which the intrapleural pressure on the effected side is neutral and on the opposite side negative, the displacement may be considerable.

If the perforation is pervious only in one direction, we deal with the "valvular or tension" pneumothorax which is rather an exception. During inspiration air passes into the pleural cavity, but during expiration no exit of air is possible. The lung becomes more and more compressed far beyond the neutral point and the symptoms rapidly increase in severity. Unless immediate relief is given death occurs within a short time by circulatory failure or by anoxemia. Under exceptional conditions this type of pneumothorax is self-limited; the intrapleural pressure grows so high that the perforation becomes occluded even during inspiration.

The idiopathic pneumothorax has very few complications. Sometimes, there is a minimal effusion in the costodiaphragmatic angle, which is generally absorbed. Characteristic of the idiopathic cases is a marked tendency to recur. As many as 15 consecutive collapses may occur in one patient.

The symptomatic pneumothorax may not be any more serious than the idiopathic type. The cases caused by the rupture of an emphysematous bleb are quite benign. Part of this group, however, shows more serious complications. A hydropneumothorax is frequent and even a pyopneumothorax is not unusual. The latter occurs mainly following the rupture of a subpleural abscess and is most always fatal, especially in young children. Other serious though uncommon complications are haemopneumothorax and subcutaneous emphysema.

The acute stage of a lung collapse must not be confused with a heart attack. The differential diagnosis is not difficult "if one only thinks of the possibility of pneumothorax." Other chances of error are: pulmonary conditions, such as capillary bronchitis, pulmonary edema, bronchopneumonia and miliary tuberculosis. Futhermore, congenital absence of a lung, congenital cysts, a diaphragmatic hernia, pneumoperitoneum and large emphysematous bullae may simulate a spontaneous pneumothorax.

On the x-ray picture a large peripheral cavity and a selective collapse may look identical and the diagnosis may be difficult. A cavity is more often apical, a pneumothorax more often in the lower part of the chest. The chest wall over cavities is usually retracted; over pneumothorax it is bulging. The vocal fremitus over cavities is usually increased and over pneumothorax pockets decreased. Pneumothorax may cause displacement of the mediastinum to the opposite side, cavities do not. Otherwise, the differential diagnosis is made from the course of the condition.

Regarding the treatment three different groups are to be considered. The pervious type of pneumothorax usually requires only a symptomatic treatment: immediate rest in half-sitting position, strapping of the chest, small doses of opiates, barbiturates. The administration of oxygen may be needed to relieve marked dyspnea. The positive pressure effected by the use of an oxygen mask or catheter may facilitate a rapid expansion of the lung. For a few weeks the patient should not do any heavy work. Slowly, he may then be rehabilitated.

Because of the recurrent character of the idiopathic pneumothorax, preventive treatment is imperative in those patients who have had more than one attack. Pleural adhesions should be obtained at any price. Various irritating solutions have been used to this end: saline solution, sterile mineral oil, 300 c.c. of the patient's own blood, a .5 per cent silver nitrate solution, small amounts of hypertonic glucose solution and so forth. Even suture of the perforated lung area to the chest wall has been resorted to. The results have been satisfactory in some of the cases and disappointing in others. A much recommended method is to continue the pneumothorax by gas refills over a period of possibly 6 to 9 months. It is well known that pneumothorax treatment alters the epithelial lining of the pleura and, after the final re-expansion, adhesion of the pleural layers generally occurs.

In the valvular type of pneumothorax immediate intervention is life saving. Decompression by paracentesis and suction must be done speedily. Reversing the bottles of a pneumothorax apparatus serves this purpose very well, but in case of emergency a large syringe may be used. If the suction has to be continued for hours a water pump may be connected with the paracentesis needle. In this group the supplementary administration of oxygen often helps the patient over the critical period. Cardiac and circulatory drugs are needed as auxiliaries.

Complications require appropriate procedures; aspiration in hydrothorax; aspiration, drainage or operation in pyopneumothorax.

The non-surgical spontaneous pneumothorax may be bilateral. The so-called "simultaneous type" is extremely rare, the "successive type" is not infrequent.[16] About 58 per cent of the bilateral cases occur in patients with active or healed pulmonary tuberculosis, about 16 per cent are supposed to be a sequel to emphysema. Besides there are quite a few idiopathic cases, whose characteristic feature is an alternating recurrence. In the case of idiopathic bilateral pneumothorax the theory of a congenital predisposition of the pleura ("a weak pleura") is most convincing. Another theory advocates the leakage of gas through an orifice in the mediastinum from one side to the other. There are, however, only a few cases of tuberculosis and traumatism in which such a theory is workable.

The symptoms of the bilateral pneumothorax do not differ from those of the unilateral type. Yet, the physician may be puzzled when he examines a patient with a previous pneumothorax on one side, who has had another identical attack. He may not find any physical signs of pneumothorax on the same side. However, if he thinks of examining the opposite side, he may discover a contralateral collapse.

The course of the bilateral pneumothorax is identical to that of the unilateral type. The symptomatic and especially the tuberculous cases have rather a poor prognosis. The idiopathic cases generally have a favorable one.

The treatment does not differ from that in the unilateral pneumothorax. In the recurrent type, in which pneumothorax refills are indicated, it is best to keep first one side collapsed and after re-expansion and formation of adhesions on this side, to proceed with the same treatment on the opposite side.

Case Report

Mr. J. A., age 45, businessman, family history negative for tuberculosis, had no previous diseases of the chest.

About one year ago, while opening a window, he had an attack of sharp pain in his right chest. Shortness of breath and heart consciousness soon developed. He dragged himself to the telephone and called a doctor, who had him taken to a hospital. There, a diagnosis of spontaneous collapse of the lung was made and confirmed roentgenographically. The attack persisted for a few hours and some shortness of breath, some soreness of the chest wall and occasional sharp pains continued for weeks. After four weeks of bedrest the symptoms had entirely subsided and an x-ray check-up after eight weeks showed the lung completely re-expanded. The reading of this latter x-ray picture showed: " . . . complete re-expansion of the lung, . . . no evidence of tuberculosis, . . . no residual findings of pathology." No relapse has occurred so far. However, the patient tells that he had a similar attack about five years ago. At that time he was taken with acute pain in his side. His doctor told him he had pleurisy and ordered bed rest. After a few days of rest he was able to return to his normal routine. No x-ray picture was taken.

Five months ago, Mr. J. A.'s daughter, Miss M. A., age 18, had a similar attack while riding on the train. She was taken to a hospital and an x-ray picture confirmed the diagnosis of spontaneous pneumothorax. After two months of bed rest the patient had completely recovered and x-ray check-up revealed complete re-expansion of the lung. No signs of tuberculosis or of any other lung pathology were detected. No relapse has occurred within the last three months. This patient had two similar attacks during the two years previous to the reported illness. These attacks, however, were very light and no check-up was made as to their true nature.

As far as I have been able to ascertain, there has not been any previous report of a familial occurrence of spontaneous collapse of the lung. These two cases suggest that hereditary factors may play an important part in the pathogenesis of the idiopathic type of spontaneous pneumothorax.

Summary

A description of pathogenesis, pathology, symptoms, signs, differential diagnosis, course and treatment of the non-surgical, unilateral and bilateral spontaneous pneumothorax and report of two cases of the idiopathic type occurring in father and daughter of one family were presented.

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Contagious Technique in Caring for Tuberculosis by Hospital and Sanatorium Employees

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The question of the hazard of an employee caring for tuberculous patients varies for the following reasons:

1. The type of patient, particularly as to intelligence and stage of disease.

2. Age, intelligence, mental alertness and dependability of an employee in caring for an infectious disease.

3. Contagious technique procedure.

It is no longer true that there is universal infection with the tubercle bacilli by the age of 15 years. In this country, about 30 per cent of our young student nurses give evidence of negative tuberculin reactions, but on graduation we find that as many as 80-100 per cent have acquired positive tuberculin tests, unless contagious technique is practiced. This leads us to the all important subject of how to protect our employees, student nurses, internes and others who work in general hospitals and sanatoria.

In Bret Harte Sanatorium, we do not practice a strict contagious technique, but our procedure with the student nurses at the general hospital differs from that of the sanatorium. Student nurses are tuberculin tested before acceptance; the negatives are retested every six months, the positives x-rayed annually. Students do not serve in tuberculosis wards. We believe, at the general hospital, that a more strict contagious technique should be instituted as follows: The school of nursing should require students to master and understand contagious technique in the very earliest part of their training, because the greatest risk is in the general admitting service, in caring for the unknown tuberculous patient, who has had no training in caring for his sputum and personal hygiene, rather than in the tuberculosis ward. This is in disagreement with those who are of the opinion that nurses in the tuberculosis service more frequently develop tuberculosis than those in the general hospital where all sorts of patients are admitted and where many unsuspected cases (1.5 to 7 per cent) are responsible for nurses becoming infected. A number of suggestions have been made by various authorities with the thought of reaching some solution in the protection of employees. One suggestion was made that older student nurses be permitted to take tuberculosis service and that only older graduate nurses be employed in sanatoria and in the tuberculosis service of the general hospital. True, a positive tuberculin test is desirable, possibly from the employer's liability standpoint.

More recent observations have shown that the human body may become infected with the tubercle bacilli whenever it is exposed, whether in infancy, senility, or at any intervening time. In fact, it has been known for some time that there is more tuberculosis in the 3rd and 4th decades of life than in the 2nd; therefore, we have no evidence that the assigning of employees of over 25 years to the tuberculosis units would in any way solve the problem.

A second suggestion has been made that we admit to the schools of nursing only those whose reaction to the tuberculin test is positive. In this respect, we have reports from Denmark, where they vaccinate all their employees with B.C.G., securing positive tuberculin tests prior to employment and, according to their reports, they have a smaller incidence of open tuberculosis in this group. However, we feel that there is no difference between this group and the one first mentioned; the remote hazards are identical.

The third group believes it is better for students to become contaminated with the tuberculosis bacilli in the hospital or sanatorium where they can be observed and given good care. This argument is fallacious from our point of view.

Fourth, it is as good for the student per-

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sonnel to contract their first infection type tuberculosis on duty, on special tuberculosis service, because of the small dosages they receive. We cannot agree with such conclusions.

Fifth, that it is well for the employee, student nurse, or interne, to become infected with the tubercle bacilli, as such infection affords adequate immunity. This, too, we believe is untrue.

Sixth, that employees and non-professional members of the hospital personnel must sooner or later become infected; therefore, the sooner the better. This, we think, is not based on sound reasoning.

The following technique is used at Bret Harte Sanatorium:

Nurses, as well as all employees, wear smocks in the wards. Gowns are worn over uniforms at all times in the wards, and are not worn out of the wards. Masks are also worn while making beds, handling linens and laundry and also at such times as respiratory infections are present. Meticulous care is taken to see that the hands are washed frequently: after caring for each individual patient, before serving diets, before pouring and administering medication, before charting, before leaving the ward and before the nurse's own meals. Hands should be kept away from the face AT ALL TIMES before cleansing. The patient's face basin and emesis basin are washed with soap and water, and boiled after use. For the bed-ridden helpless patient, whose sputum is teeming with acid-fast bacilli, the same technique is carried out, but an endeavor is made to group these patients and, it is true, they frequently require more intimate bedside care. However, we think, at the sanatorium, that the above technique is practical and adequate in both instances. These procedures can be carried out in the general hospital as well as the sanatorium, except that the smock should be changed, as well as the hands cleansed, on leaving such a patient or group of patients to care for others. Soap and water, air and sunshine are the principle agents used in the care of walls and floors of cubicles, rooms, and furniture, such as table, stand, and bed. Three pillows are issued to each patient. These are his own property until he leaves the institution and when this occurs, the pillows and mattresses are cleaned with the vacuum and then sunned. Blankets and bed linen are sent to the laundry and handled by as few people as possible.

In an ideal set-up, each patient is provided with a thermometer which may be kept at the bedside in 70 per cent alcohol solution. If individual thermometer technique is not possible, the ward thermometer must be washed in soap and water and soaked in alcohol or an antiseptic solution. Since tuberculosis is transmitted from person to person through the sputum, disposal is of first importance. Proper methods must be thoroughly understood by the nurse and taught to the patient so that he will not be a menace to others when he again takes his place in the community. All of the nurse's efforts toward prevention may be wasted, if she fails in her duties as a health teacher.

The first measure that the patient is taught is to cover his mouth while coughing. Squares of soft paper tissues which may be destroyed after first use are appropriate. A paper bag fastened to the patient's bed or within easy reach is used for disposal. These bags are collected daily and burned. The sputum cup is collected twice daily or when half full. The paper liner or cup is removed from metal holder with forceps and placed on several layers of paper or in paper bags. The cup is filled with sawdust to absorb the moisture and insure complete burning. Without touching the cup with the hands, it is wrapped in paper and tied securely with string. It is then placed in a receptacle for burning. Ambulant patients are usually responsible for the care of their own sputum cups, under the supervision of the nurse.

To summarize, we must ever realize that tuberculosis is infectious, its infectiousness to human beings depending upon several variants; that there is no objection to strict contagious disease technique in the handling of tuberculosis patients. However, we feel that this is unnecessary and that modified technique is efficient, but that its effeciency depends upon the vigilance of a trained professional personnel, particularly the Superintendent of Nurses, with the cooperation of

other employees. We also feel that these should be picked for their neatness, mental alertness, physical condition, age, and conscientious dependability. Much also depends upon the type of patient, his mental capacity, alertness, intelligence and his cooperation. Conceding this, we feel that incidence of infection with modified contagious technique is no greater and possibly even less than in the general population.

Early Diagnosis of Tuberculosis

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Tuberculosis, despite the knowledge and results obtained in the past fifty years, still remains one of our major problems in the field of medicine. It is hoped that the following suggestions, many of which are based on an experience of some thirty-five years in this field, may be helpful.

As it is not always easy to make a diagnosis of tuberculosis, and this paper deals with the pulmonary type only, the first requisite is, especially in obscure conditions, always to bear in mind the possibility of tuberculosis, even if for no other reason than to rule it out. With careful attention to every detail, it is quite possible to make the diagnosis from symptoms alone, even before the physical signs are present. It is well to remember that certain races seem prone to the disease, especially the Negro and the Chinese.

The first requisite in the diagnosis is a carefully taken history, both family and personal. A history of tuberculosis in the family, and especially of contact, is always important. The home conditions: cleanliness; ventilation; deficiency of sunlight; financial status; over work, both physical and mental; and occupation, have a bearing. Attacks of fever, transitory in type, especially if attended by malaise; one or more attacks of pleurisy; repeated attacks of bronchitis, especially if unilateral; and frequent colds are always suspicious.

The symptoms of early tuberculosis are indefinite and usually extend over a more or less protracted period. The first warning may be the coughing up of blood, varying in quantity, and often following some form of exertion, such as running. A slight cough, not always short or dry, with or without expectoration, may be the first warning; this may be constant or intermittent. Should there be expectoration, a sputum examination is indicated and should be repeated, as one examination, even if negative, does not necessarily rule out tuberculosis. One should remember that it is possible to have tuberculosis even with a negative sputum. There are disturbances of the circulation, with rapid pulse and pallor.

A rectal temperature is usually more reliable than an oral one. You may find catarrhal attacks starting as a cold in the head and working downward into the lungs, resulting in a bronchitis, with a more or less protracted course. This tendancy may exist for months before tuberculosis is suspected and the bacilli appear. Such cases, especially when accompanied by a tuberculosis history, are most suspicious. There may be pain over the affected area, either constant or intermittent, usually neuralgic or rheumatic in type, with a consequent diagnosis of neuralgia or rheumatism. This pain is usually the result of a localized pleurisy and is considered diagnostic by some writers. In this connection, it is always well to bear in mind the possibility of lung cancer. Lung cancer is considerably more common than we have been led to believe in the past. Whenever there is severe pain and dyspnoea, out of all proportion to the x-ray and physical findings in the chest, and it cannot be explained in any other way, cancer of the lung should be seriously considered, if for no other reason than to rule it out.

The next step in importance is the type of breathing present, as there are depressions above or below the clavicle or clavicles. The affected side lags on deep inspiration and expansion is restricted; ordinarilly, a

limitation of excursion at the bases on the affected side can be noticed.

After this follows percussion of the chest. In this connection, with practice, one can close his eyes and his ears and map out the impaired area, or areas, by the feeling under the finger. There is a resistance over the impaired area readily transmitted to the finger. Over affected areas the percussion note is duller and the resonance diminished, or in some instances slightly higher and with a tympanitic note.

The determination of the respiratory note is the next step. It may be the rough vesicular type, or it may be a weak vesicular type, or a combination of both. Rough respiration is the earliest sign and is present even before percussion reveals any evidence of change. Weak respiration comes next in importance. In this connection care should be exercised to eliminate nasal obstruction or the plugging of a bronchus. At times, the respiration is jerky—always a suspicious sign. It is only when we have contraction that we get a sharpened inspiration accompanied by a prolonged and sharpened expiration. The respiration may be loud or soft or a combination of the two. Diminished respiration at the apex, in the young, unless due to nasal obstruction or a plugged bronchus, means activity; in the adult, a healed lesion. Rales, if present, are usually heard in more or less advanced cases. In the early cases they consist of a simple click, at the extreme end of inspiration, or persistent fine crepitations, or they may even take the type of a sharp groan or whine. All these are constant and are heard at the end of inspiration or the beginning of expiration and on and after cough. This rule may be safely followed, rales which on repeated examination are constantly to be heard and are limited to a definite area, are quite indicative of tuberculosis. Increased whispered voice heard over these areas is another important sign.

Sputum examinations, as mentioned earlier in this paper, repeated if necessary, are always indicated whenever there is expectoration, with or without cough. If this procedure is followed, many cases of tuberculosis will be detected early which otherwise might have gone on to a stage where recovery would be difficult or impossible.

X-rays of the chest are of valuable assistance and should always be made, if possible, as a routine procedure. In this connection may I say, that if one will discount his physical findings by at least a third, that is, if he will consider that there is a third more affected area in the chest than his physical findings reveal, he will check very closely, if not absolutely, with the x-ray. Otherwise, to his dismay, he will find the x-ray reveals considerably more involvement than was brought out on examination and, as a result, much more alarm accrues to the patient.

Tuberculin tests in doubtful cases are valuable adjuncts and for the best results, should be carried out only by those qualified in their use. All positive reactors should have a chest x-ray as well, since a tuberculin test tells one of the presence of tuberculosis somewhere in the body, but not always where.

In summary, the early diagnosis of tuberculosis can only be made from a careful correlation of all data obtainable by a meticulous examination and then only when so arranged that it spells **TUBERCULOSIS**.

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Book Review—Clinical Tuberculosis*

*Edwin R. Levine, M.D.***

Clinical Tuberculosis. Edited by Benjamin Goldberg, M.D., Philadelphia: F. W. Davis Co., 1939. 2nd edition. 2 Vols. $15.00.

This is a new edition of a system which should be familiar to everyone interested in tuberculosis. For we might as well mention at the start, that this is the best book on the subject that is at present procurable.

The treatment and study of tuberculosis is considered to be a specialty. It is however a specialty that involves the entire body, includes both medical and surgical approaches, and enters research laboratories as well as public health offices. Its wide scope not only justifies but demands that a text on the subject be the collaboration of the ideas of many men. And that is the plan of these volumes, a collaboration of monographs on the various aspects of tuberculosis.

This new edition, coming so soon after the first, is evidence of the progressiveness that must be evidenced if a book or an individual, for that matter, wishes to keep abreast of the constant advances in this field. What was good enough five or ten years ago is hardly satisfactory now, even though certain fundamental concepts do not change.

Nowhere is this more true than in epidemiology and statistics. Year by year the incidence and death rate from tuberculosis are changed. Today the rates are markedly lowered. Some of the authors of articles in medical journals who discuss individual rates today by comparing them to a general rate, which is however, ten to twenty years old, should note the course of the statistics shown by Drolet in the chapter on Epidemiology.

We might make the same suggestion as regards Jaffe's splendid chapter on Pathology, and Caryllos' discussion of Pathogenic Physiology. Although the subject of pathogenesis of tuberculosis still has many an unsolved problem and many a debatable concept, there does not seem to be any justification for the confusion which exists in the literature. It was a relief to read a clean cut scientific statement of pathology and pathogenesis based on the facts instead of supposition. Of the section on Physiology, we may simply say that it should be required reading for all men who deal with pulmonary diseases, especially those interested in therapy.

Most of the sections dealing with fundamental knowledge of tuberculosis have been little changed. There are the excellent chapters on diagnosis by physical, laboratory and x-ray methods that were found in the earlier edition. To the chapter on classification has been added a section on Endobronchial Tuberculosis, a subject that has been the center of much interest and discussion in recent years. Formerly it was overlooked entirely, while today there is perhaps too much emphasis on tuberculosis of the bronchi especially as regards treatment.

Another section which bears mention, is that dealing with collapse therapy and chest surgery. In the modern treatment of tuberculosis, collapse is almost indispensable for those cases that require active treatment, and surgery has developed from a desperate remedy to an everyday procedure. No book could be considered complete unless this aspect of treatment was also fairly completely covered.

The chapters dealing with the various phases of collapse therapy are both complete and intelligible. There are good discussions of pneumothorax and thoracoplasty. One may look in vain for some of the procedures which are enjoying something of a vogue at present in some quarters, but it would seem logical to include only such measures as have been judged by clinical experience for a sufficient period. It would be manifestly impossible to include all ideas, suggestions, and treatments that are found everywhere in such profusion, nor would it be in any way desirable.

As for the complications and the extrapulmonary lesions, these are subjects of many chapters in the latter section of the book. These are the aspects of tuberculosis which are often seen in general hospitals. Because of this fact, they are frequently handled by men whose knowledge and experience in tuberculosis are rather meager. And as every surgeon, laryngologist and urologist knows, the approach to a tuberculous condition varies in many ways from the approach to any other.

These chapters, which deal with extrapulmonary conditions, may well serve as a reference book for those who come in contact with tuberculosis only occasionally. In fact, it should be found in the library of every general hospital and should be looked into as the need arises.

There is one chapter which is entirely new, that on Tuberculosis in Industry, by Ornstein and Ulmar. This subject has taken on more importance as compensation and liability laws have been widened.

Once again a great deal of confusion has occurred in the discussions on tuberculosis as an occupational disease and on the questions of silicosis and of trauma. Much of this confusion

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* Editor's Note:—Because this review is so comprehensive and because it expresses our views completely, we are reprinting it in toto from the January, 1940, Vol. V, No. 2, issue of *The Quarterly Bulletin of Sea View Hospital.*

** Editor, *The Quarterly Bulletin of Sea View Hospital.*

would be eliminated, if the concepts were first checked against fundamental knowledge of pathology and pathogenesis. This chapter clarifies the subject, simplifies the discussion and never wanders from known and accepted ideas of pathogenesis. It is worth reading and perhaps rereading when asked for an opinion on an industrial case.

We have made no attempt to analyze each individual part of the book. It seemed better to pick out certain sections for mention, sections which are the most vital parts of any such work. We should perhaps speak of the numerous illustrations which are reproduced in a manner that makes it possible to see the point illustrated. That is a matter of some importance.

This is a two volume set that belongs in every medical library. We shall repeat what we said in the beginning, that this is the finest work procurable at the present time on the subject of tuberculosis and as such we shall continue to recommend it to those who are looking for a good book on the subject.

New Case-Finding Method

Abstract of Report

Development of a reasonably accurate yet relatively inexpensive method of applying x-ray examination to large groups of people in tuberculosis case finding was described in a paper delivered before the Radiological Society of North America at its Atlanta meeting. Authors of the paper were Drs. Hollis E. Potter, of Chicago, and Bruce H. Douglas and Carl C. Birkelo, of Detroit.

Reporting on a study of 1610 cases, on which both regular 14-inch x 17-inch radiographs and 4-inch x 5-inch photographs of the fluorescent image were made for comparative diagnosis, their method of photo-roentgenography was characterized as a "type of examination which can be applied . . . to large numbers rapidly and economically," having "definite advantages over certain other x-ray methods," which "can be applied directly without preliminary tuberculin testing," and which "offers a practical method for case finding in tuberculosis for use in surveying large numbers of susceptible groups."

After giving recognition to the work previously carried on by others in an effort to achieve a similar objective, the authors pointed out that Dr. Potter, in consultation with the General Electric X-Ray Corporation laboratories, after much study and experimentation arrived at the conclusion that the most desirable objective in photography of the fluorescent image should be to produce a small film, small enough to make a real economy in its use, and yet large enough to be readily interpreted without enlargement, or at least no greater enlargement than that provided with a simple reading glass.

Working on this basis it was found that a 4-inch x 5-inch film with an effective focal range slightly smaller than this would answer the requirements. Special equipment was therefore designed by the General Electric X-Ray Corp. for producing such photo-roentgenographs, according to the discussion.

The technique of producing this film requires a modern x-ray installation with capacity to permit exposures of from 20 to 80 milliampere-seconds at from 60 to 80 kilovolts, an impulse timer, and a tube-screen distance of 50 inches or 125 centimeters—thus producing as little distortion as possible.

The fluorescent screen used is nearly seven and the lens is also a specially prepared instrument with a rating of F.1.5, and is mounted in a tunnel with the screen at the opposite end so that both can be moved up and down to adjust to the proper level for a patient standing upright. This lens is capable of producing a very sharp image in an area of about 3.7 inches in diameter on the 4 x 5 film.

"In order to test the capacity of this 4 x 5 film, which is called miniature film," the essayists pointed out, "it was decided to examine a large number of patients with both the regular 14 x 17 size film as well as with the miniature film, both films to be taken at the same visit of the patient to the x-ray department. The regular film represents as nearly as possible the most up-to-date technique. It is taken at 72 inches tube-film distance, using a rotating anode tube, 400 ma., and from 60 to 75 kv., and the time on an impulse timer varies from 1/40 to 1/20 second depending on the thickness of the patient's chest from actual measurements with calipers. 1610 cases were so examined and an interpretation of the miniature film was always made and recorded independently, and before a similar record of findings was made from the regular film, because the regular film was the standard by which the efficiency of the miniature film must be measured.

"Two hundred and seventy-one patients had active tuberculosis and they include the primary type with lymph node enlargement, wet pleurisy, and minimal, moderately and far advanced cases. This is the group which was of primary interest and five of the minimal lesions were missed in the interpretation of the miniature films. Two

other minimal lesions were called healed primary. All of these lesions are very small and might easily be missed in a regular film taken at a different angle, a slightly different depth of breathing, or with less perfect technique. In nearly every instance these lesions, which were missed, were superimposed by rib shadows in the miniature and not obscured in the regular film.

"Granted that there were five completely missed lesions and two others called healed primary, making a total of seven missed out of 271 active lesions, there is an error of 2.6 per cent."

On the basis of careful calculations and actual records it was estimated that the cost of materials only for 4 x 5 photo-roentgen films was about one-tenth that for regular 14 x 17 radiographs of the chest.

Comparing the new method with other means of group survey work, Drs. Potter, Douglas, and Birkelo pointed out that, in common with other x-ray methods, it requires only one visit by the patient while several may be needed for complete tuberculin testing, results in a permanent record, is more acceptable to patients, and provides a means of detecting other non-tuberculous lesions of the heart and lungs. It is more economical than the use of full size radiographs, and more accurate than fluoroscopy alone, they suggested. Considering the even smaller 35-mm. film, they declared that while these micro-films are quite inexpensive to produce, they are, in the opinion of many, too small. 35-mm. films must be enlarged either by projection or printing in order to interpret and in this enlargement considerable detail is lost, they said.

"While the 35-mm. method has not yet been subjected to careful comparison for accuracy with full size film and with 4 x 5 film, some observation of its use suggests that too much has been sacrificed in accuracy in favor of economy, which is not true of 4-inch x 5-inch film", they concluded.

—General Electric X-Ray Corporation.

Organization News

SCIENTIFIC PROGRAM COMMITTEE FOR SIXTH ANNUAL MEETING OF THE COLLEGE REPORTS

Outstanding Speakers Will Present Papers

Dr. George Ornstein, New York City, Chairman of the Scientific Program Committee for the Sixth Annual Meeting of the American College of Chest Physicians to be held at the Biltmore Hotel, New York City, June 8-10, 1940 announces that the following speakers will appear on the program:

Saturday, June 8th, 9:00 a. m.

Dr. Foster Murray, Brooklyn, N. Y., Chairman.

Dr. Walter C. Hausheer, Newark, New Jersey: "Chronic Pulmonary Diseases from the Insurance Point of View."

Dr. John N. Hayes, Saranac Lake, N. Y.: "The Indications of Voluntarily Discontinuing Pneumothorax Treatment."

Dr. Herbert R. Edwards, New York, N. Y.: "Case Finding—A Fundamental in Tuberculosis Control."

Dr. Richard H. Overholt, Boston, Massachusetts: "Extrapleural Pneumothorax: A Report of Experiences and Present Day Indications."

Saturday, June 8th, 2:00 p. m.

Drs. Israel G. Epstein, Myron Herman, and Henry Green, Brooklyn, N. Y.: "The Correlation Between Tomographic Studies of the Lung and the Necropsy Findings; Both Studies Done Shortly After Death".

Dr. Andrew L. Banyai, Wauwatosa, Wisconsin: "Newer Aspects of the Pneumoperitoneum Treatment of Pulmonary Tuberculosis."

Dr. D. Matsuzawa, Staten Island, New York: "Diagnosis of Bronchopleural Fistula in Tuberculous Empyema."

Dr. Louis H. Clerf, Philadelphia, Pa.: "Bronchoscopy in Bronchial Obstruction."

Sunday, June 9th., 2 p. m.

Dr. David Ulmar, New York, N. Y., Chairman.

Dr. William F. Reinhoff, Jr., Baltimore, Md.: "Surgical Management of Carcinoma of the Lung."

Drs. Harold Brunn and Sidney Shipman, San Francisco, Calif.: "Certain Aspects of Intrapulmonary Cavitation."

Dr. Harold Neuhof, New York, N. Y.: "Surgical Treatment of Acute Pulmonary Abcess."

Dr. Louis-R. Davidson, New York, N. Y.: "Surgical Treatment of Mixed Infection, Tuberculous Empyema."

Monday, June 10th.

Dr. Edward P. Eglee, New York, N. Y., Chairman.

A number of clinics will be held in the tuber-

culosis hospitals throughout the city. The subjects to be presented at these clinics will be announced later.

"Information Please" Luncheons

A novel method for conducting a question and answer period will be inaugurated this year at the College luncheons. Two such sessions have been planned by the program committee. The first of these luncheons will be held on Saturday, June 8th, and the second one will be on Sunday, June 9th.

Seated at the speakers' table will be a bacteriologist, a surgeon, a radiologist and a phthisiologist. Questions directed to these experts will come from the floor and they will be interrogated by the chairman, Dr. Edward P. Eglee, who will receive the questions.

"Information Please" should prove an interesting method for bringing out pertinent information concerning our specialty.

In view of the fact that a large attendance is expected, it is advisable that reservations for these luncheons be made early. Please write at once to the Executive Secretary of the College, P. O. Box 1069, El Paso, Texas, for reservations.

The names of the physicians who are to discuss the papers on the program will be announced at a later date. Watch for the completed program in these columns.

PROGRAM COMMITTEE RECEIVES CONGRATULATIONS

The officers of the American College of Chest Physicians congratulate the chairman and the members of the Scientific Program Committee for the very excellent program which they have arranged for the 1940 meeting. It is refreshing to note that each of the subjects are of current interest. The newest happenings in pathology, diagnosis and treatment of chest diseases are to be presented at this meeting and we trust that every fellow of the College will make it a point to attend the meeting. Write to the Executive Secretary of the College today for your reservations.

SIXTH ANNUAL MEETING

Biltmore Hotel, New York City
June 8-10, 1940

Scientific Program Committee—George Ornstein, M.D., New York, N. Y., General Chairman.

Medical Section—Foster Murray, M.D., Brooklyn, N. Y., Chairman; James S. Edlin, M.D., New York, N. Y.; Raphael Bendove, M.D., New York, N Y.; Barnett P. Stivelman, M.D., New York, N. Y.

Surgical Section—David Ulmar, M.D., New York, N. Y., Chairman; Nagla M. Laf Loofy, M.D., Brooklyn, N. Y.; George A. Lassman, M.D., New York, N. Y.; Stanley L. Wang, M.D., New York, N. Y.

Clinical Section—Edward P. Eglee, M.D., New York, N. Y., Chairman; Henry L. Dorfman, M.D., New York, N. Y.; Maurice Kovnat, M. D., Staten Island, N. Y.; Eli H. Rubin, M. D., Bronx, N. Y.

Entertainment Committee—James S. Edlin, M.D., New York, N. Y., Chairman; Alice D. Weber, M.D., New York, N. Y., Vice-Chairman; Sydney Bassin, M.D., New York, N. Y.; Julius P. Dworetzky, M.D., Liberty, N. Y.; Irving I. Sarot, M.D., New York, N. Y. Chas. W. Rieber, M.D., Forest Hills, N. Y.; Emanuel Singer, M.D., New York, N. Y.; Harry St. John Williams, M.D., Poughkeepsie, N. Y.; Morris Tannenbaum, M.D., Bronx, N. Y.

General Arrangements Committee — Edgar Mayer, M.D., New York, N. Y., Chairman; Harry Golembe, M.D., Liberty, N. Y., Vice-Chairman; Willard J. Davies, M.D., Rockville Center, N. Y.; George Foster Herben, M.D., Yonkers, N. Y.; Israel Kaufman, M.D., Brooklyn, N. Y.; Edwin P. Kolb, M.D., Holtsville, N. Y.; A. A. Leonifoff, M.D., Poughkeepsie, N. Y.; John M. Nicklas, M.D., Valhalla, N. Y.; Clarence A. Read, M.D., New Rochelle, N. Y.

FELLOWS OF THE COLLEGE HOLD MEETING AT TUCSON

The Fellows of the American College of Chest Physicians held a meeting at the Santa Rita Hotel, Tucson, Arizona, February 16th. Murray Kornfeld, Executive Secretary of the College, addressed the meeting. He spoke on the progress made by the College and the present and future program of the College. Dr. Chas. S. Kibler, Governor of the College for Arizona presided at the meeting. A telegram from Dr. Frank Walton Burge, Philadelphia, Chairman of the Board of Regents, was read by the chairman, urging a good attendance of the Tucson Fellows at the New York meeting to be held June 8-10th.

ELECTED TO OFFICE FOR THE ATLANTA TUBERCULOSIS ASSOCIATION

Dr. Champ H. Holmes, Atlanta, Georgia, former President of The American College of Chest Physicians, and Chairman of the Committee for the Advancement of Scientific Programs in Organized Medicine, has been elected President of the Atlanta Tuberculosis Association. Dr. A. Worth Hobby, also a Fellow of the College was elected Chairman of the Association's Medical Staff.

Dr. I. D. Bobrowitz, Otisville, New York, a Fellow of the College, is now Medical Superintendent for the Municipal Sanatorium of the City of New York at Otisville.

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CONTRACT LET FOR TUBERCULOSIS HOSPITAL

Construction work on a $60,000 tuberculosis ward for the City-County Hospital of El Paso was begun in February. The ward will be for the use of indigent patients.

FELLOWS PRESENT AT MEETING

Present at the Annual meeting of the Tuberculosis and Public Health Association of Louisiana, held in Monroe, on January 30th and 31st, were: Doctor Paul Turner, Fellow of the College, who addressed the meeting, the title of his paper being, "Let's Take Stock"; Dr. Julius L. Wilson, of New Orleans, Regent of the College for District Number 8; and Doctors W. S. Conklin and Charles R. Gowen, both Fellows of the College and both of Shreveport.

TEXAS TUBERCULOSIS ASSOCIATION TO MEET

The thirty-first annual meeting of the Texas Tuberculosis Association will be held in Corpus Christi, Texas, April 11, 12, and 13, 1940, with headquarters at the Nueces Hotel. Among those on the program will be the following Fellows of the College: Dr. Donato G. Alcaron, Mexico City, D. F.; Dr. C. J. Koerth, San Antonio, Texas; Dr. R. G. McCorkle, San Antonio, Texas; Dr. Sim Hulsey, Ft. Worth, Texas; and Dr. F. N. Moore, Austin, Texas.

COUNTY TUBERCULOSIS COMMITTEES FORMED

Doctor S. M. Bittinger, Chairman of the North Carolina State Tuberculosis Committee, reports through Dr. Karl Schaffle, Governor of the College of the State of North Carolina, that County Tuberculosis Committees have been organized, as follows:

Robeson County: Drs. Holmes, Fiarmont; Fred Nash, St. Pauls; Robert Croom, Maxton.

Iredell-Alexander Counties: Drs. Dwight Myers, Harmony; Charles B. Herman, Statesville; C. L. Bittinger, Mooresville.

Forsyth County: Drs. F. D. Craig, J. P. Davis, P. A. Yoder, Winston-Salem.

New Hanover County: Drs. J. C. Wessell, R. B. Rodman, Earnest Bullock, Wilmington.

McDowell County: Drs. D. M. McIntosh, G. S. Kirby, Frank Wood.

Durham County: Drs. D. T. Smith, D. R. Perry, Hunter Sweany, Durham.

Buncombe County: Drs. Wilson Pendleton, Julian Moore, J. W. Huston.

FELLOWS OF THE COLLEGE AT SAN DIEGO MEET

The Fellows of the American College of Chest Physicians of San Diego, California, met at Hotel El Cortez, San Diego, on February 21st. The meeting was addressed by Murray Kornfeld, Executive Secretary of the College, who spoke on the accomplishments of the College to date and its future program. Dr. Stephen A. Parowski was the chairman of the meeting.

DR. GOLDBERG ADDRESSES FELLOWS OF COLLEGE AT PHOENIX

Dr. Benjamin Goldberg, Chicago, Illinois, First Vice-President of the American College of Chest Physicians addressed the Fellows of the College at Phoenix, Arizona. Dr. Goldberg spoke on the progress of the College and the advancement of tuberculosis organization within medicine. Dr. Goldberg is the chairman of the committee supervising the organization of tuberculosis committees in the state and county medical societies under the Pennsylvania Plan as adopted by the College. Dr. Victor S. Randolph, Phoenix, Arizona, Regent of the College, was chairman of the meeting.

MEETING OF LOS ANGELES FELLOWS

Mr. Murray Kornfeld, Executive Secretary of the College, announces that a meeting of the Los Angeles Fellows was held at the Los Angeles County Medical Society Building at 6:30 p. m., Friday, February 23, 1940. The meeting, which included a dinner, was held under the direction of Dr. E. W. Hayes, former President of the College and was addressed by Mr. Murray Kornfeld, Executive Secretary of the College.

FELLOW ELECTED TO OFFICE

Dr. Forrest L. Loveland of Topeka, Kansas, a Fellow of the College, was elected President of the National Conference of Medical Services for the year 1940-41, at a meeting of the organization held in Chicago on February 11, 1940. Dr. Loveland had formerly served as secretary of the conference for the year, 1939-40.

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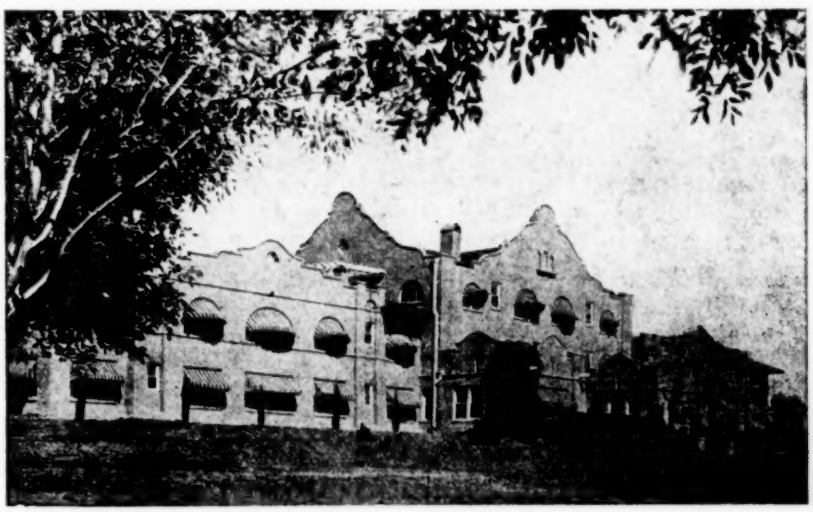

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DR. JACKSON ADDRESSES MEDICAL SOCIETY

Dr. Chevalier Jackson of Philadelphia, Pennsylvania, a Fellow of the College, together with Dr. Joseph Brennemann of Chicago, presented a symposium on epidemic tracheobronchitis before the Peoria City Medical Society on January 4, 1940.

DR. MYERS SPEAKS BEFORE PUERTO RICAN SOCIETY

According to the *Boletin de la Asociacion Medica de Puerto Rico,* Dr. Jay Arthur Myers, of Minneapolis, Minnesota, a Fellow of the College, spoke before the Annual Meeting of the Medical Association of Puerto Rico, which was held on December 8, 9 and 10, 1939.

PUBLIC HEALTH MEETING ON TUBERCULOSIS

The fourth annual meeting of the Rhode Island Public Health Association was held at Providence, R. I., January 23, 1940, the topic of discussion being tuberculosis control. Dr. Herbert R. Edwards, Director of the Tuberculosis Bureau, New York City, and Dr. Alton S. Pope of Boston, Director of the Division of Tuberculosis in the Massachusetts Health Department were among the speakers.

TENNESSEE SETS UP TUBERCULOSIS DIVISION

By authorization of the 1939 Tennessee Legislature, a separate division of tuberculosis has been organized within the Tennessee Department of Health. The new unit will be devoted to study and research, case finding and hospitalization. Dr. Royden S. Gass of Franklin, will be in charge of the division.

FORLANINI INSTITUTE FELLOWSHIPS POSTPONED

According to the *Bulletin* of the National Tuberculosis Association, the competition for the six Fellowships usually available at the Carlo Forlanini Institute in Rome has been indefinitely adjourned, due to present European conditions. Fourteen applications had already been received from twelve countries, including the United States.

TUBERCULOSIS HOSPITAL TO BE BUILT

A sixty-six bed tuberculosis hospital is to be built in connection with the Lincoln State School and Colony, Illinois, according to *Welfare.*

DR. MARTIN L. STEVENS

1865—1940

Dr. Martin L. Stevens, of Asheville, North Carolina, a Fellow of The American College of Chest Physicians, died January 20th, at the age of seventy-five years. He was born in Thomasville, Ohio, and graduated from the Baltimore Medical College in 1891, serving a year's internship at the Maryland General Hospital. He came to Asheville in 1899 to join the staff at Winyah Sanatorium. He then went to New York for post-graduate study and upon his return opened a private office, specializing in tuberculosis.

He represented North Carolina in the House of Delegates of the American Medical Association for the last sixteen years of his life. He was President of the North Carolina State Medical Society in 1930 and also served as a member of the State Board of Medical Examiners. He was a charter member of The National Tuberculosis Association and the first President of the North Carolina Tuberculosis Association. He was Chief of Staff of St. Joseph's Hospital, Asheville, and consultant to state sanatoriums at both Southern Pines and Black Mountain.

Dr. Stevens was a Fellow of the American College of Physicians; a member of the American Climatalogical Association and of the Southern Medical Association. He was a certified specialist of the American Board of Internal Medicine.

He was of a quiet, retiring disposition, but always approachable and generous of his time and his money. Three years ago he gave a dinner for the members of The Buncombe County Medical Society from his reimbursed travel allowance as delegate to the A.M.A. The Asheville newspapers deplored his loss as a leading citizen; and the Lutheran Church, as it's leading pillar. He was held in affectionate esteem by all who knew him.

KARL SCHAFFLE, M.D.
Governor for North Carolina.